

Common indicator plants of Missouri Upland Forests

Assembled by Susan Farrington, November 2009. Illustrations from Yatskievych (1999, 2006) and from Britton and Brown 1913. Photographs by Susan Farrington (SF), Meg Timpe (MT), Dan Drees (DD), Dan Tenaglia (DT) from the www.missouriplants.com website website (© Karen Tenaglia moflora@hotmail.com) and the Virginia Tech Dendrology website www.cnr.vt.edu/DENDRO/DENDROLOGY/main.htm

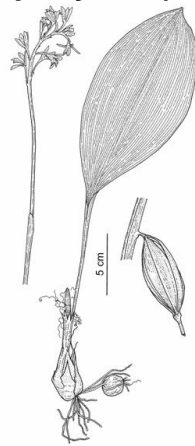
Aplectrum hyemale (Adam and Eve orchid, putty root)

Orchidaceae

Leaves emerge in fall and overwinter, withering at flowering time in spring, dark green with **silvery white veins**, somewhat puckered, usually purplish beneath.

Brownish yellow flowers bloom in May on leafless stalks. **Seed pods** are visible for an extended period in fall and early winter.

Rich soil of mesic forests in ravines and stream valleys.



Seed pods



Arisaema triphyllum (jack-in-the-pulpit)

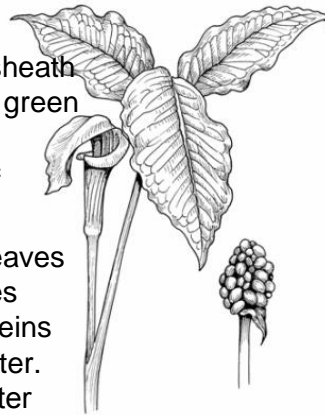
Araceae

Each leaf is **divided into 3 leaflets**. The leaves are on relatively long leaf stalks, and the leaves continue to grow larger during the growing season.

The flowers are wrapped inside a tubelike green sheath called a **spathe**. The spathe may be whitish green or brown with white stripes.

Mesic upland forests and bottomland forests, bluff bases.

Compare and contrast with *Trillium* species: the leaves look very similar, but Jack-in-the-pulpit leaves have one main center vein, with the lateral veins heading out to the leaf margins from the center. *Trillium*'s lateral veins run parallel to the center vein.



Asarum canadense (Wild ginger)

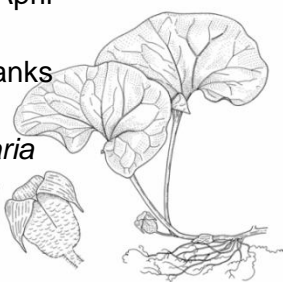
Aristolochiaceae

Rounded dark green leaves with heart-shaped bases arise from creeping stems along ground. **Leaf stalks are hairy**.

Maroon flowers arise from the base of the leaf stalk and are hidden under the leaves. Blooms April-May.

Bottomland and mesic upland forests, stream banks and terraces, bases of bluffs.

Compare and contrast with bloodroot (*Sanguinaria canadensis*). Bloodroot's leaves are more irregularly lobed and are lighter yellowish-green.



***Anemone americana* (formerly *Hepatica nobilis* var. *obtusata*) (hepatica, liverleaf)**

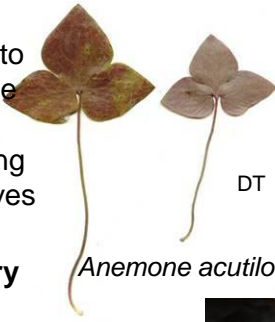
Ranunculaceae

Low growing plant with leaves divided into 3 lobes with heart-shaped bases. The leaves become leathery and reddish purple, **visible through winter**, drying up and disappearing as the new leaves emerge in the spring.

Bluish, white or pink flowers appear **very early in spring** (March-early April).

Rich or rocky wooded slopes and ravine bottoms, along mossy banks and ledges, usually in acid soils, but also on calcareous substrates.

Anemone acutiloba is very similar and found in the same habitats. It has pointed leaflets.



Anemone acutiloba



Anemone americana

***Cardamine concatenata* (toothwort)**

Brassicaceae

Clusters of small white flowers with four petals. Blooms in April before the trees leaf out.

Leaves are deeply divided with sharp teeth along the edges.

Plants turn yellow during May and are completely **dormant by early summer**.

Rich mesic forest, ravine bottoms or slopes of ravines and bluffs.



DT



SF

***Caulophyllum thalictroides* (blue cohosh)**

Ranunculaceae

Large plant, standing 1 ½ feet to 2 ½ feet tall. **Bluish gray compound leaves** with lobed leaflets. Stems and leaves are both **smooth**.

Yellow, purple or green small flowers. **Blue fruits** with a **gray waxy coating**.

Mesic upland forests, rich slopes in ravines, bottomland forests, shaded ledges of bluffs.



DT



SF

***Claytonia virginica* (spring beauty)**

Portulacaceae

Low plants with **white to pinkish small flowers**, sometimes with pinkish striping. **Blooms in April** before trees leaf out.

Leaves are narrow, strap-like and **succulent** (rubbery feeling).

All parts of plant are **edible**; leaves and flowers are used in salads or as cooked vegetables; underground corms are boiled in salted water.

Moist alluvial forest, valley bottoms, upland forest on level ground or hillsides.



***Delphinium tricornes* (dwarf larkspur)**

Ranunculaceae

Deep blue, purplish or whitish flowers on 1 to 2 foot tall plants. Blooms **mid April-early May**.

Deeply divided succulent leaves. Leaves and stems have very fine downy hairs.

Rich or rocky woods, slopes, valley and ravine bottoms, bluff ledges, stream banks.

Compare with Carolina larkspur which is taller, blooms in late May, has smaller thinner leaves, and is found on glades.



***Erythronium albidum* (white trout lily, white dogtooth violet)**

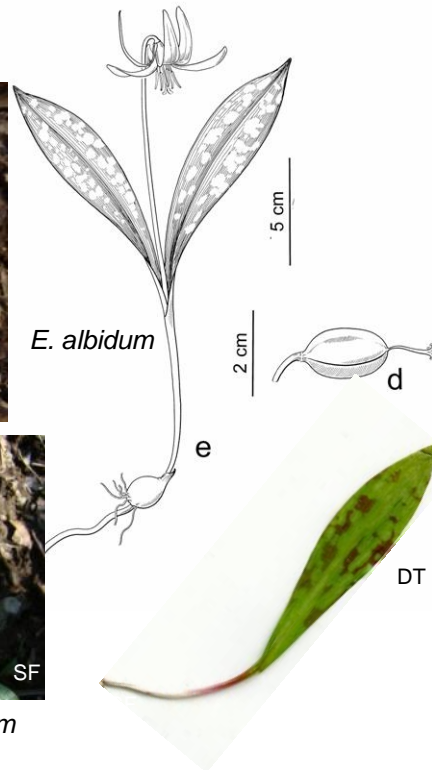
Liliaceae

Succulent smooth gray-green leaves, often mottled with brown spots, emerge in **large colonies** early in spring. Leaves turn yellow and go dormant by early summer.

White flowers appear on 6" tall stalks in **April**.

Mesic bottomland and upland forests of ravines and valleys, alluvial soils.

Compare with **yellow dogtooth violets** (*E. rostratum* and *E. americanum*), which are found in the same habitats, but are less common.



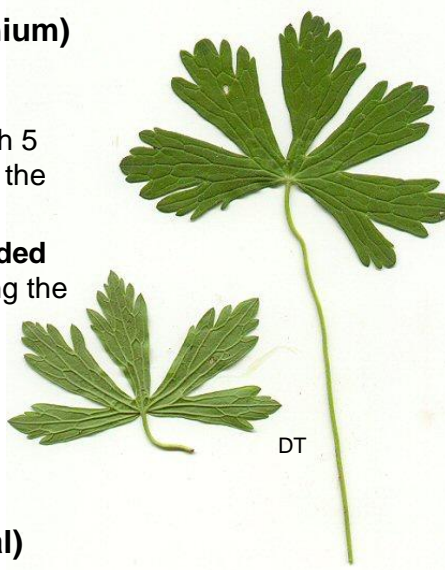
Geranium maculatum (wild geranium)

Geraniaceae

Pink to rose-lavender flowers with 5 petals in clusters at the top of the hairy stems.

Leaves on long stalks, **deeply divided into 5-7 lobes** with teeth along the margins.

Common in mesic woods.



Hydrastis canadensis (goldenseal)

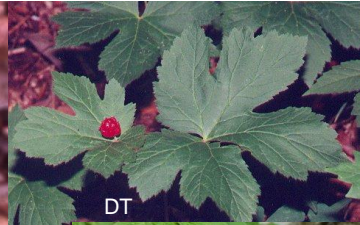
Ranunculaceae

White flowers followed by a large red berry cluster (raspberry-like).

Leaves with five lobes, **smaller and wrinkled when they emerge in spring** (3-10 cm wide), **later expanding greatly**. Doubly toothed margins.

Roots are knotty yellow rhizomes.

Rich woods, slopes, ravines, wooded valley floors.



Panax quinquefolius (American ginseng)

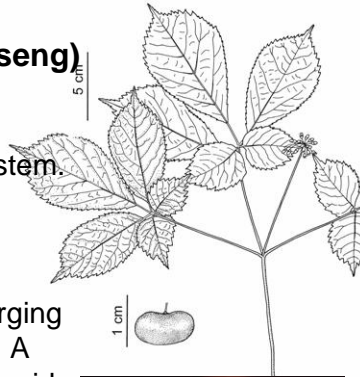
Araliaceae

Leaves occur in a **whorl** at the top of the stem. Each leaf is compound, with 3 to 5 leaflets.

Small insignificant greenish white flowers emerge in May-June on a stalk emerging from the base of the whorl of leaves. A cluster of **red berries** is produced in mid to late summer or early fall.

Uncommon: bottomland and mesic upland forests, often in ravines, ledges of shaded bluffs and rock outcrops.

Compare and contrast with *Parthnocissus quinquefolia* (Virginia creeper): note different leaflet shape and arrangement, and ginseng never vines. Young plants of *Sanicula* spp. look like young ginseng: note that **ginseng leaflets have erect hairs along the midvein on the upper surface**.



***Phlox divaricata* ssp. *laphamii* (wild sweet william, blue phlox)**

Polemoniaceae

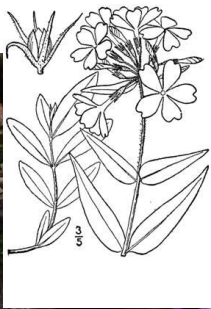
Lavender to purple blossoms with 5 petals in **April-May**.

Stems trail along the ground when vegetative, and flowering stems are about 1 foot tall.

Leaves are narrower and more pointed on flowering stems, and more rounded on vegetative stems. Leaves and stems may be **hairy or mostly smooth**.

Rich or rocky low moist woods.

Compare to *Phlox pilosa*, which is a Woodland/Glade indicator: it has pale pink to bright rose flowers in May, and has narrower fuzzy leaves and fuzzy stems. It is found in dry upland rocky habitats.



***Polemonium reptans* (Jacob's ladder)**

Polemoniaceae

Light blue flowers with 5 petals in loose clusters at the top of their stems. April-May.

Leaves are compound with pairs of leaflets opposite one another, somewhat **fern-like**.

Rich moist, low woods or protected slopes.



***Polygonatum biflorum* (Solomon's seal)**

Liliaceae

Greenish-white bell shaped flowers dangle in pairs underneath leaves. Blue berries develop by late summer, early fall.

Arching smooth stems, 1 to 3 foot high.

Mesic bottomland and upland forests in valleys and ravines, roadsides.

Compare with *Maianthemum racemosum* (false solomon's seal), which is found in both forests and woodlands. Its white flowers are grouped all together on a stalk at the top of the plant, NOT hanging from below the leaves.



***Sanguinaria canadensis* (bloodroot)**

Papaveraceae

One of the **earliest plants to bloom**. Showy **white blossoms** with multiple petals emerge in March generally, and bloom for only a short time.

Leaves are just emerging at bloom time, expanding after blooming and eventually turning yellow by mid summer. They are grayish-green, kidney shaped and irregularly lobed.

Large fleshy root emits a **red sap** (as does the rest of the plant), thus "bloodroot".

Lower slopes of moist or rocky woods, moist wooded valleys.



***Trillium* species (wake robin, trillium)**

Liliaceae

There are several species of *Trillium*, all of which are good indicators of rich forest habitat.

White or purplish red 3-parted flowers in April-May.

Leaves appear 3 in a whorl on top of a smooth stem. Plants turn yellow and disappear by mid summer.

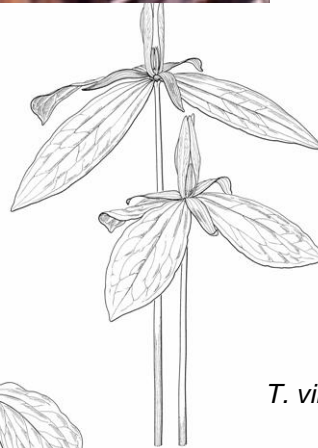
Mesic bottomland and upland forests on lower slopes, bottoms of valleys and ravines.



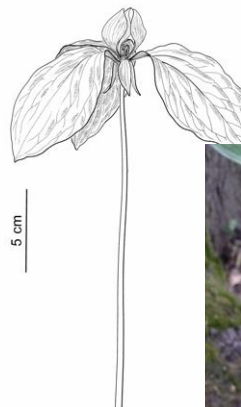
T. sessile



T. flexipes



T. viride



T. recurvatum



***Uvularia grandiflora* (bellwort)**

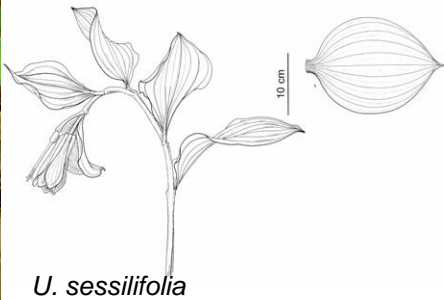
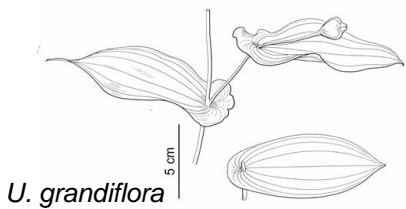
Liliaceae

Bright yellow flowers dangle from the top of the smooth stems in April-early May.

Leaves encircle stems.

Mesic bottomland and upland forests in ravines and valleys, shaded bluff ledges and stream banks.

Similar species: ***Uvularia sessilifolia*** (found mostly in northeastern MO, but also recorded from Oregon County): **leaves do not encircle stems, pale yellow flowers.s.**



***Veratrum woodii* (false hellebore)**

Liliaceae

Large shiny deep green pointy leaves emerge in early spring, and almost resemble corn stalks when they are first coming up! After emerging, they widen out. Veins are parallel.

Blooms mid summer, with small maroon to purplish brown flowers at the tips of tall stems.

Moist north and east facing lower slopes of mesic upland forests, usually associated with dolomite rock outcroppings.

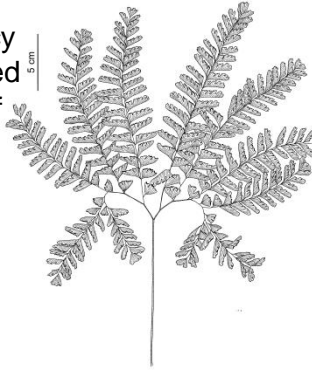


FERNS

Adiantum pedatum var. *pedatum* (northern maidenhair fern)

Very graceful dark green lacy foliage, leaves arranged in a **whorl** at the top of the **black stems**.

Rich slopes of ravines in mesic upland forests.



Cystopteris protrusa (fragile fern)

Bright lime green foliage emerges in early spring and often withers by mid to late summer.

Mesic bottomland forests, rich soil of lower slopes.



DT



Polystichum acrostichoides (Christmas fern)

Dark green **almost evergreen foliage** (still green at Christmas time, hence the name. Sometimes visible all winter.) Each leaflet has a small lobe at the base (like a little ear).

Wooded slopes in mesic and dry-mesic forest, more commonly on acidic substrates.



MT



DT

WOODY TREES AND SHRUBS

Asimina triloba (pawpaw)

Anonaceae

Large shrub to small tree, to 30'. Grows in colonies from sucker sprouts.

Large **leaves smell like green peppers** when crushed. Broadest above middle. Green upper surface, paler beneath.

Twigs odiferous when crushed, **terminal bud velvet brown, lacking scales**.

Maroon flowers in late April-May. Large **banana-like fruits** in September.

Mesic lower slopes, ravines, valleys. Rich sites.



DD



DD



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Carpinus caroliniana (musclewood, hornbeam)

Betulaceae

Tall shrub or small tree, to 35'.

Lvs with **upper surface often shiny, undersurface mostly smooth, or with hairs in vein axils only**, margins with small sharp teeth.

Twigs slender, gray or red, zig-zag, small buds.

Bark is smooth, tight, thin, bluish-gray, sometimes blotched, fluted into **muscle-like ridges**.

Produces flowers in catkins in April-May.

North-facing bluffs, rich woods at base of bluffs, rocky slopes along streams, ravine bottoms, low wooded valleys and moist woodland.

Compare and contrast to *Ostrya virginiana* (ironwood or hop hornbeam, found in both mesic forests and drier woodlands): leaves are softly hairy, especially on lower surface. Bark is shaggy.



Virginia Tech



Virginia Tech



Virginia Tech



Virginia Tech

Carya cordiformis (bitternut hickory)

Juglandaceae

Medium sized tree.

Leaves with 7-9 leaflets, upper surface shiny, lower surface paler and hairy.

Stout twigs, greenish-brown to reddish-brown, shiny, hairy when young, smooth later.

Buds are bright sulfur yellow and long. Bark light gray, with shallow, interlocked ridges.

Fruit is rounded, husk 4-winged just above middle.

Low woods along streams and river bottoms, mesic to drier forest.



Virginia Tech



SF



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mature bark



Virginia Tech

***Lindera benzoin* (spicebush)**

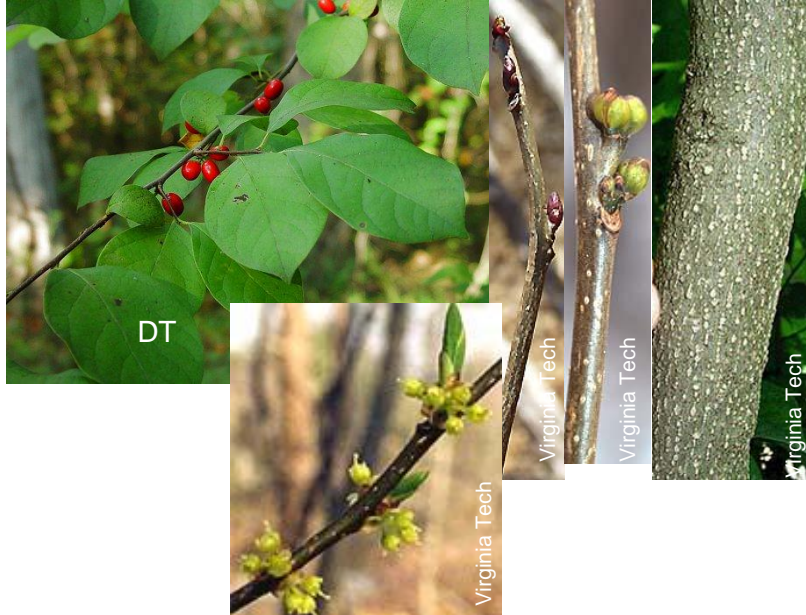
Lauraceae

Multi-stemmed shrub to 18' with spreading branches.

Leaves **very fragrant (spicy)** when crushed, bright green above, whitish below.

Small yellow flwrs in early spring, followed by **red berries** on female plants.

Low or moist bottomland forest, thickets along streams, valleys, mesic forest slopes.



***Staphylea trifoliata* L. (bladdernut)**

Staphyleaceae

Thicket-forming shrub or small tree to 25'.

Three-parted leaves are **opposite** on the stem.

White tubular flowers dangle in clusters in April-May. Fruits are **bladder-like capsules** that persist into late fall/winter.

Twigs flexible, smooth, reddish-brown to greenish-brown, often striped.

Rich wooded valleys, north and east facing wooded slopes, often with dolomite outcropping, along streams.



***Tilia americana* (basswood)**

Tiliaceae

Medium to large tree, to 60'.

Leaves broadest near base, margin coarsely toothed, gland-tipped; tip pointed; base unequal. Upper surface dark green, smooth, shiny; lower surface paler, smooth with **tufts of hair in vein axils**.

Twigs slender, smooth, green to brown when young, gray later. Numerous pores. **Buds dark red, egg-shaped, 1/4"**.

Bark light brwn to gray, deep furrows and narrow, flat-topped long ridges. **Often has sprouts around base of older trunks**.

Flowers and fruit **attached to strap-shaped reduced leaf**.

Compare with *Morus rubra* (mulberry, has milky sap, growth form crooked, seldom has sprouts around base, some leaves may be lobed, grows in many habitats).

